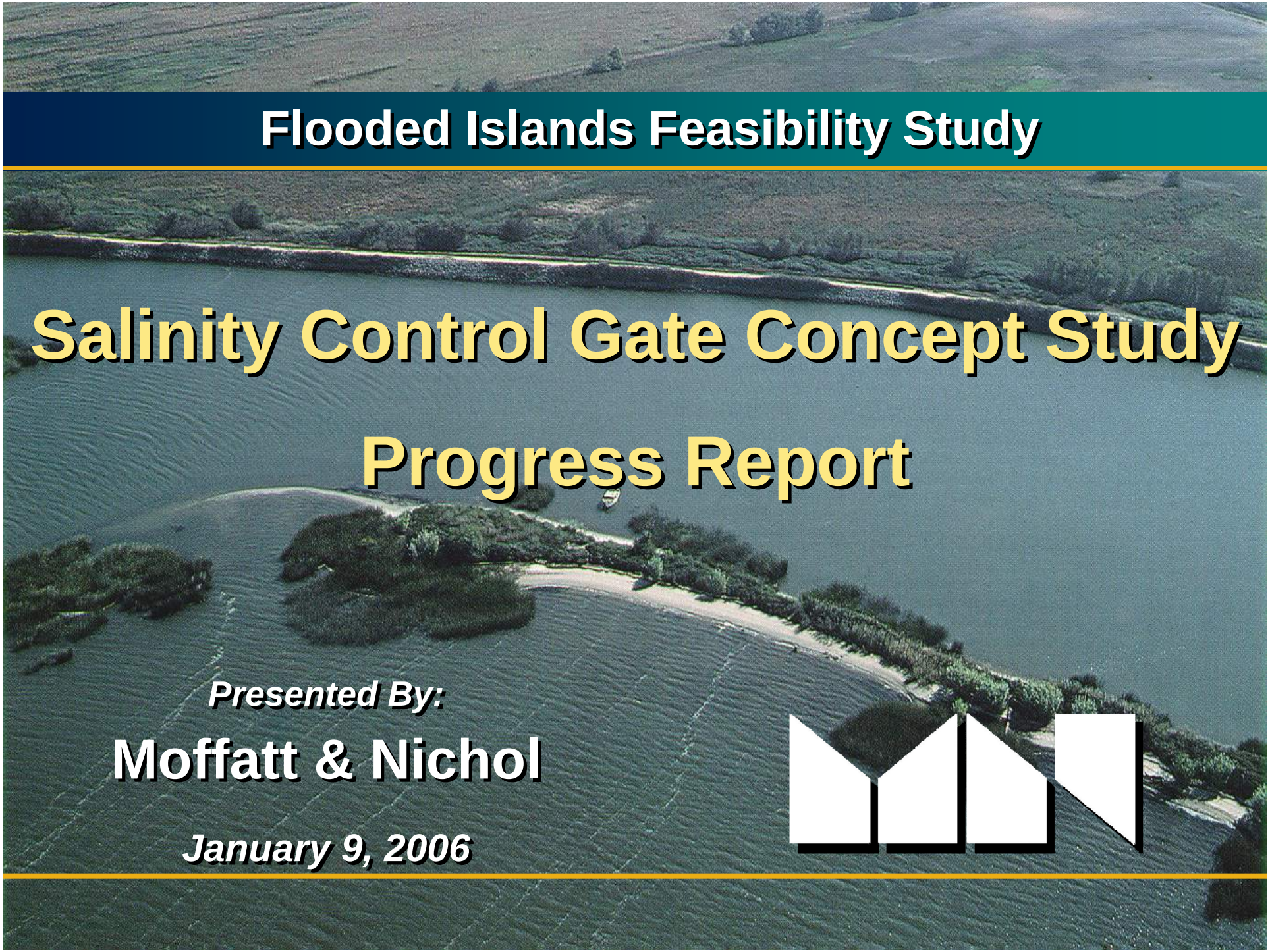

Flooded Islands Feasibility Study

Salinity Control Gate Concept Study

Progress Report

Presented By:

Moffatt & Nichol

January 9, 2006

Presentation Focus

- Salinity Control
- Emergency Response

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- Salinity Control
- Emergency Response

Moffatt & Nichol Qualifications

- Marine Structures Engineers
- Experienced in:
  - Delta and San Francisco Bay Area (i.e. Franks Tract Restoration; Levee Seismic Risk)
  - Engineers with Real Offshore Experience (i.e. North Sea etc.; and Float-Over Construction Techniques)
  - Marine Foundations (i.e. New Bay Bridge Foundations; SFO Runway Development Program)

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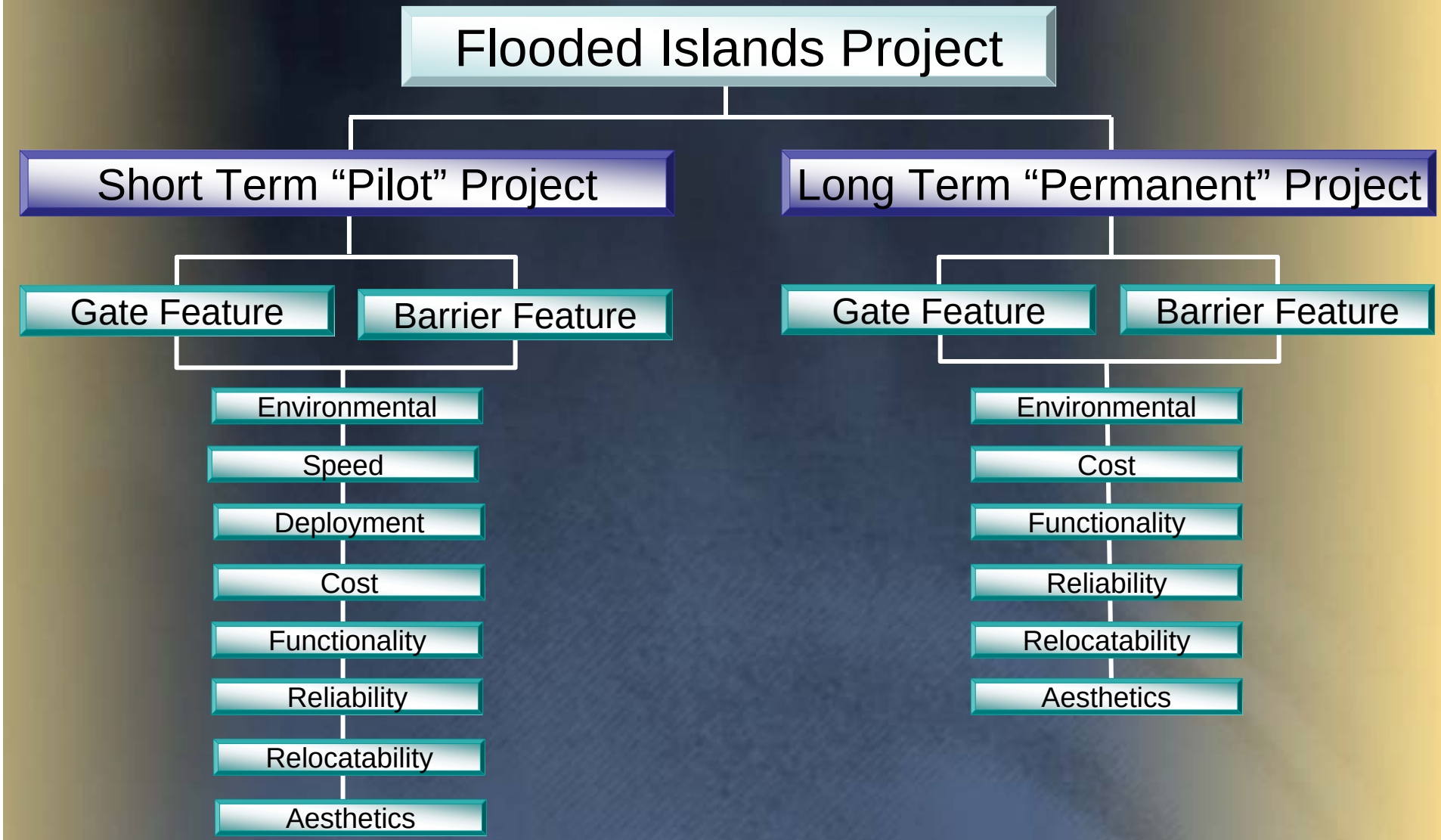
Flooded Islands Project
Short Term “Pilot” Project
Long Term “Permanent” Project
Gate Feature
Barrier Feature
Gate Feature
Barrier Feature
Environmental
Speed
Deployment
Cost
Functionality
Reliability
Relocatability
Aesthetics
Environmental
Cost
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Reliability
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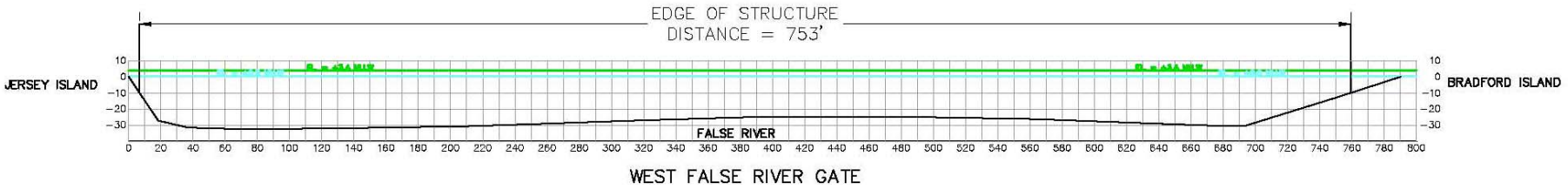
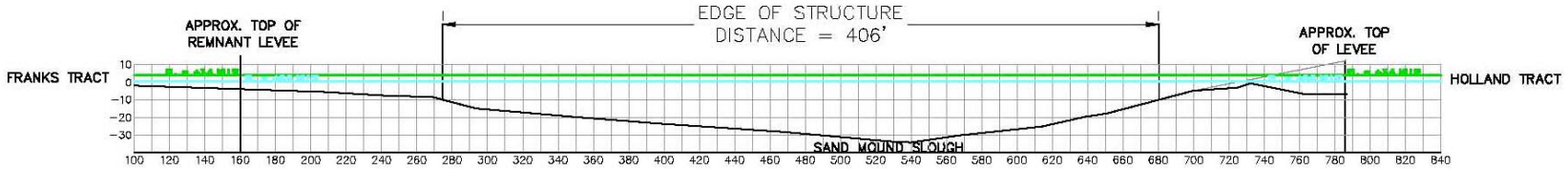
Aesthetics

Potential Site Locations

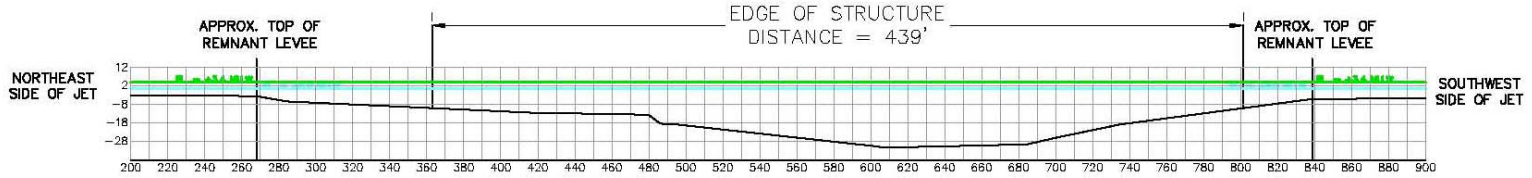
Site Conditions



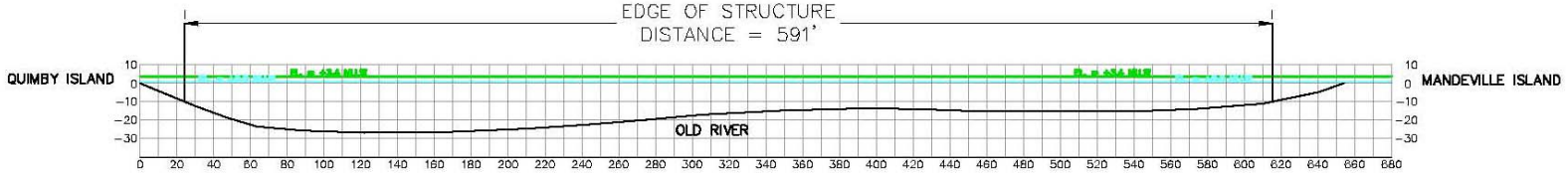
WEST FALSE RIVER GATE



SAND MOUND SLOUGH
GATE AT OLD RIVER

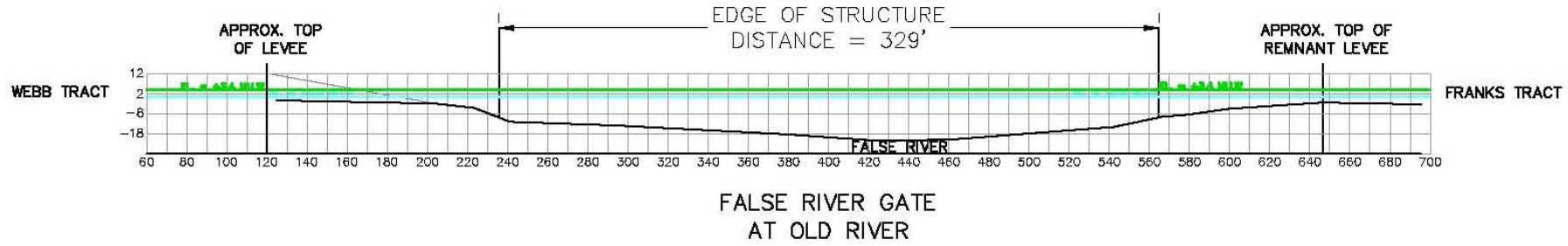


MAIN JET AT
FRANKS TRACT



COX BARRIER – OLD RIVER

Site Conditions



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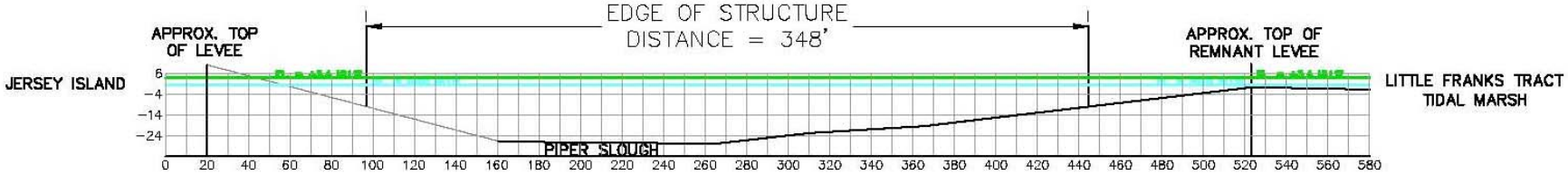
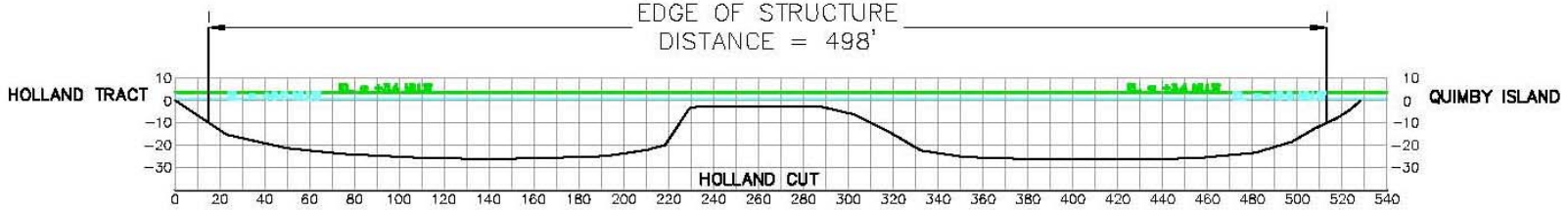
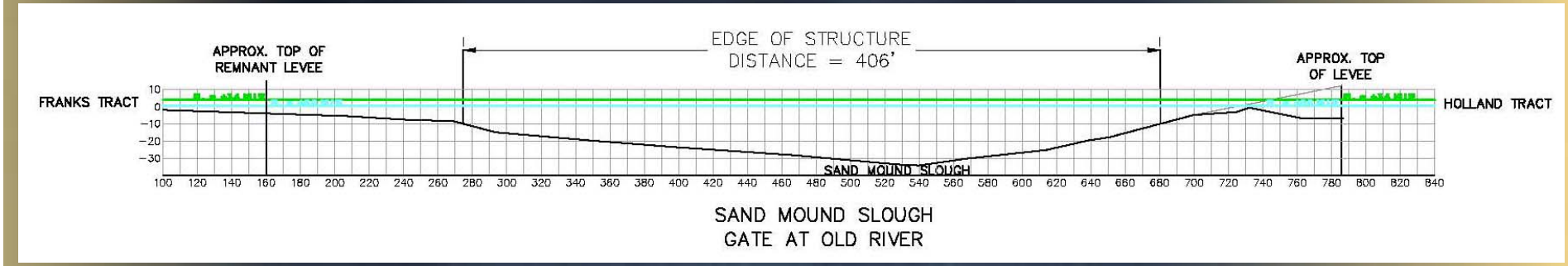


WEST FALSE RIVER GATE
AT PIPER SLOUGH



COX BARRIER – HOLLAND CUT

Typical Section



SAND MOUND SLOUGH
GATE AT OLD RIVER

Deployment Methods

- Environmental Impact
- Speed of Installation
- Relocatability
- Buy vs. Rent

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- Speed of Installation
- Relocatability
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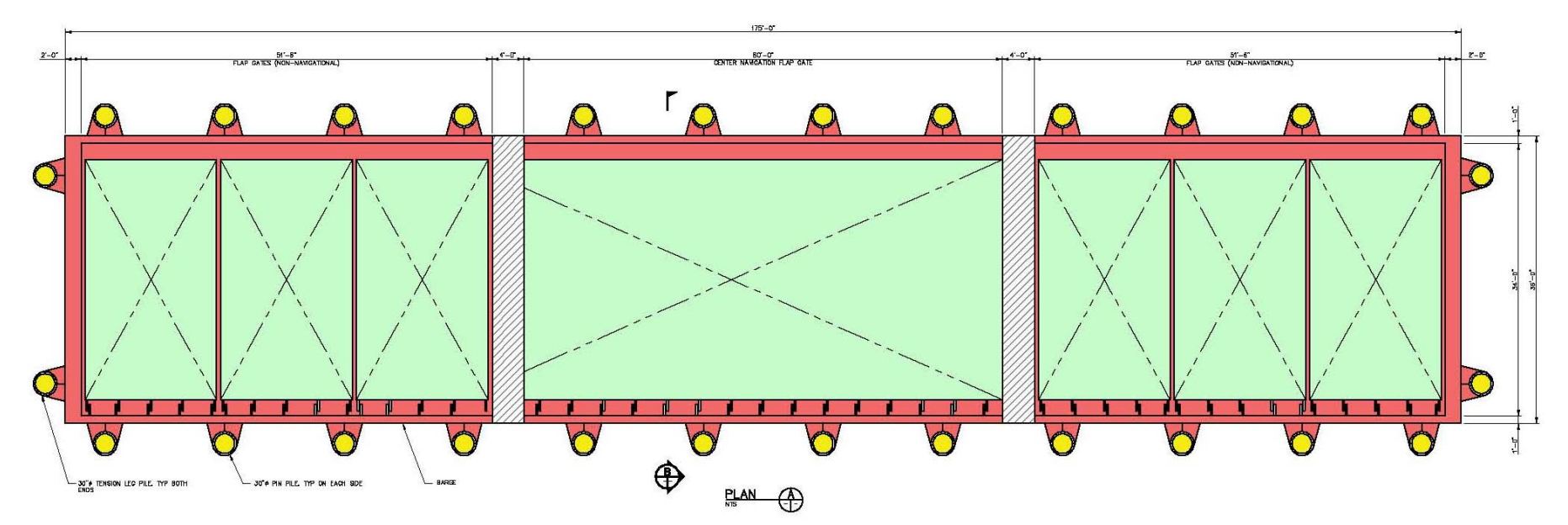
Deployment Methods

Tension Leg Platform



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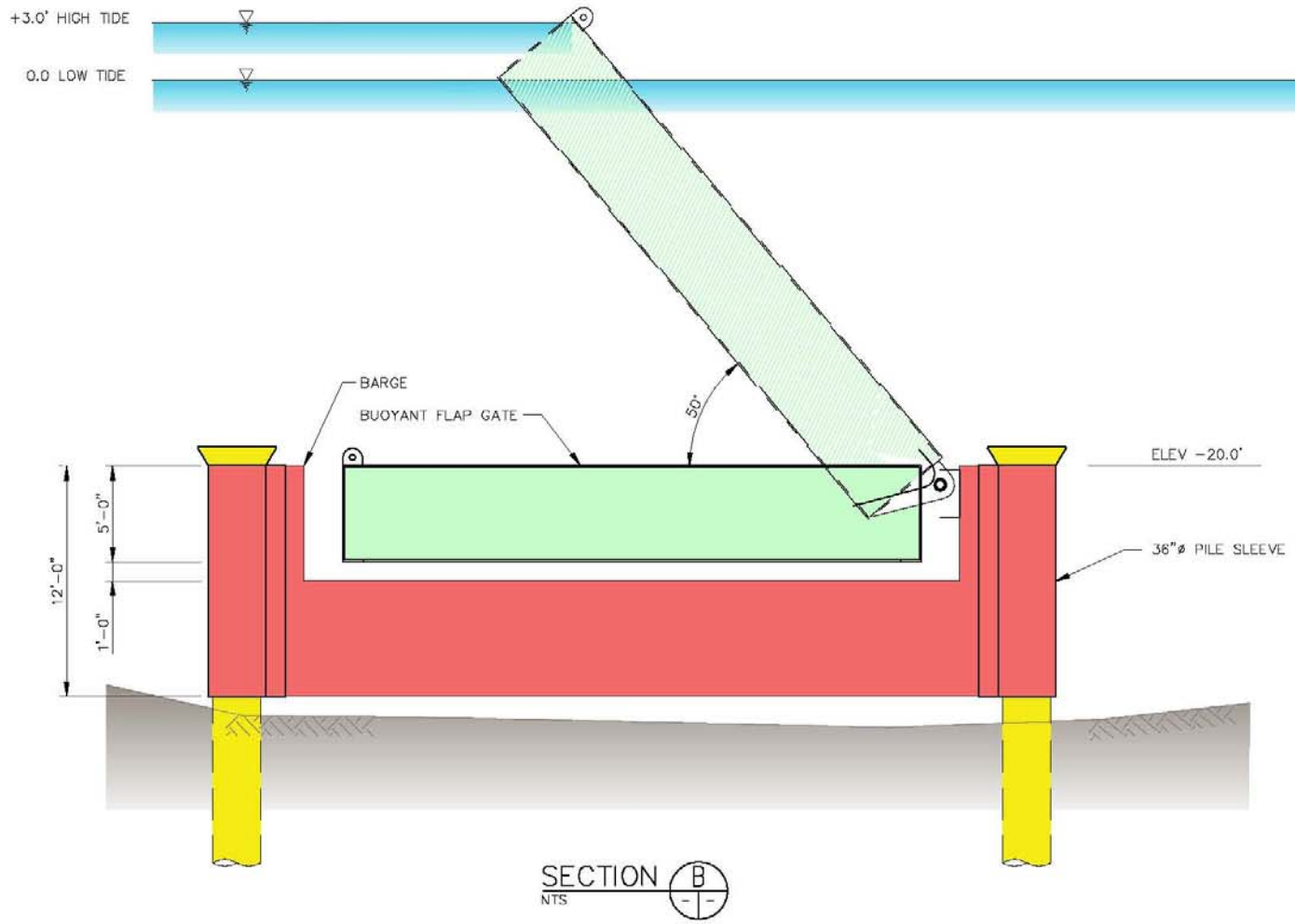

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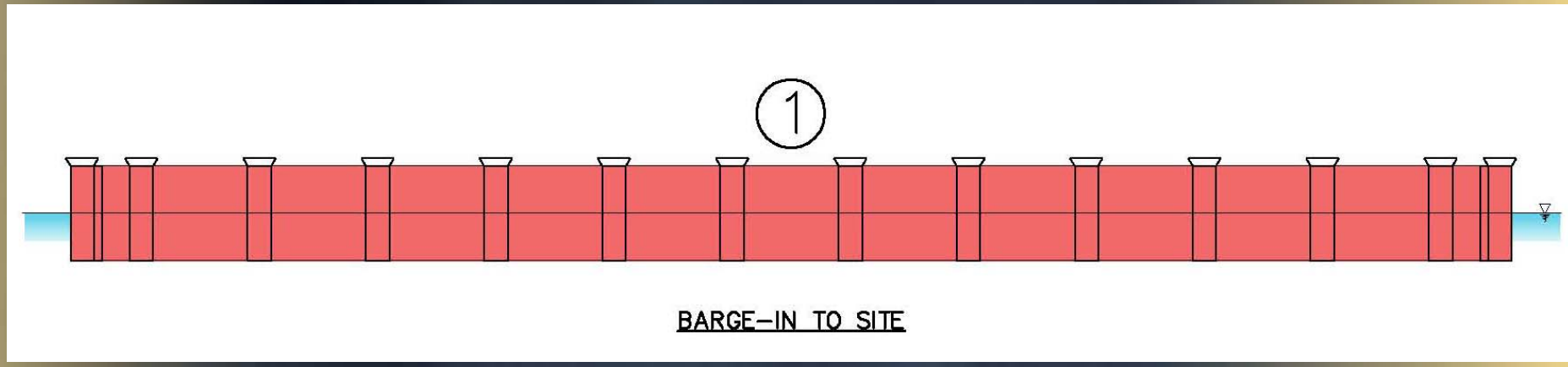

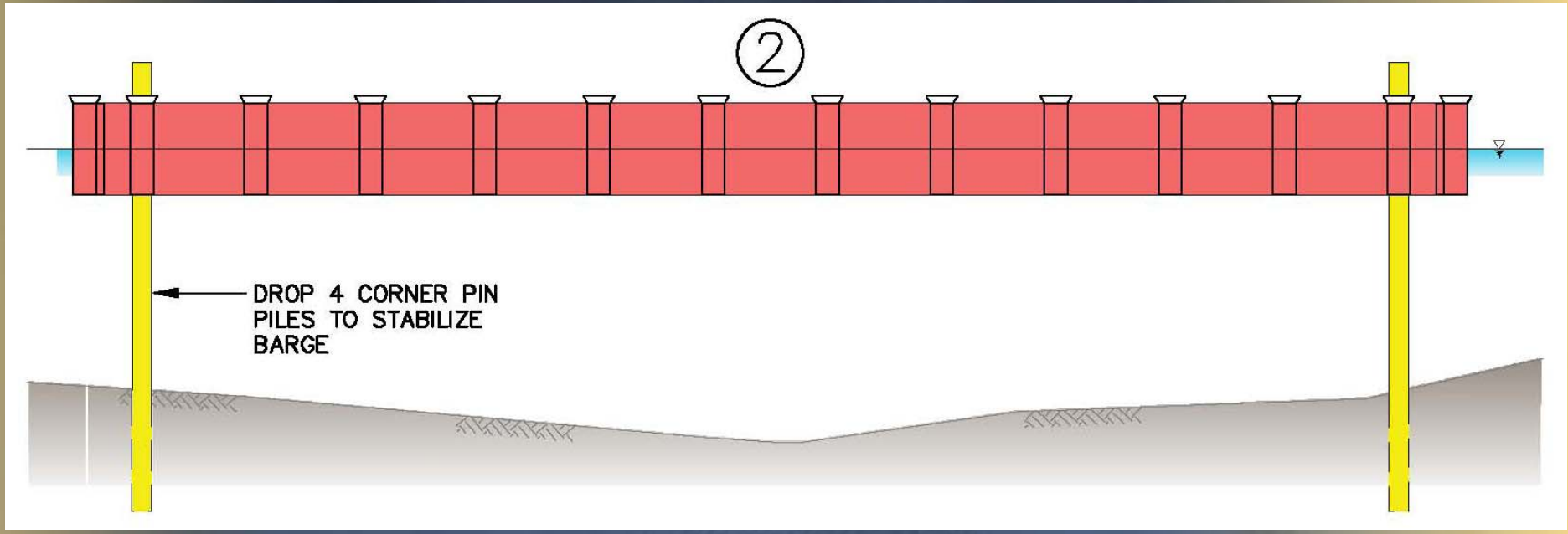

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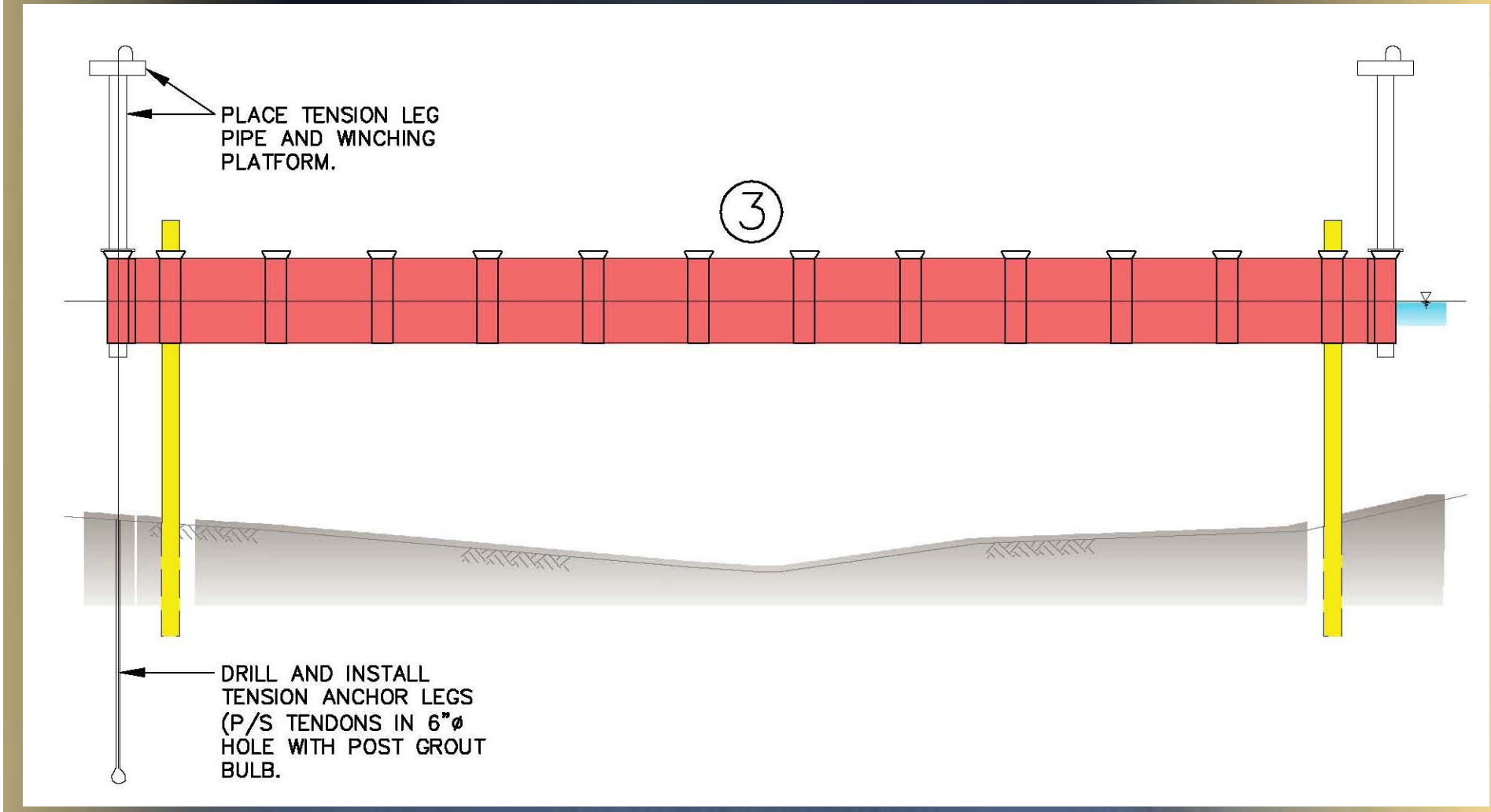

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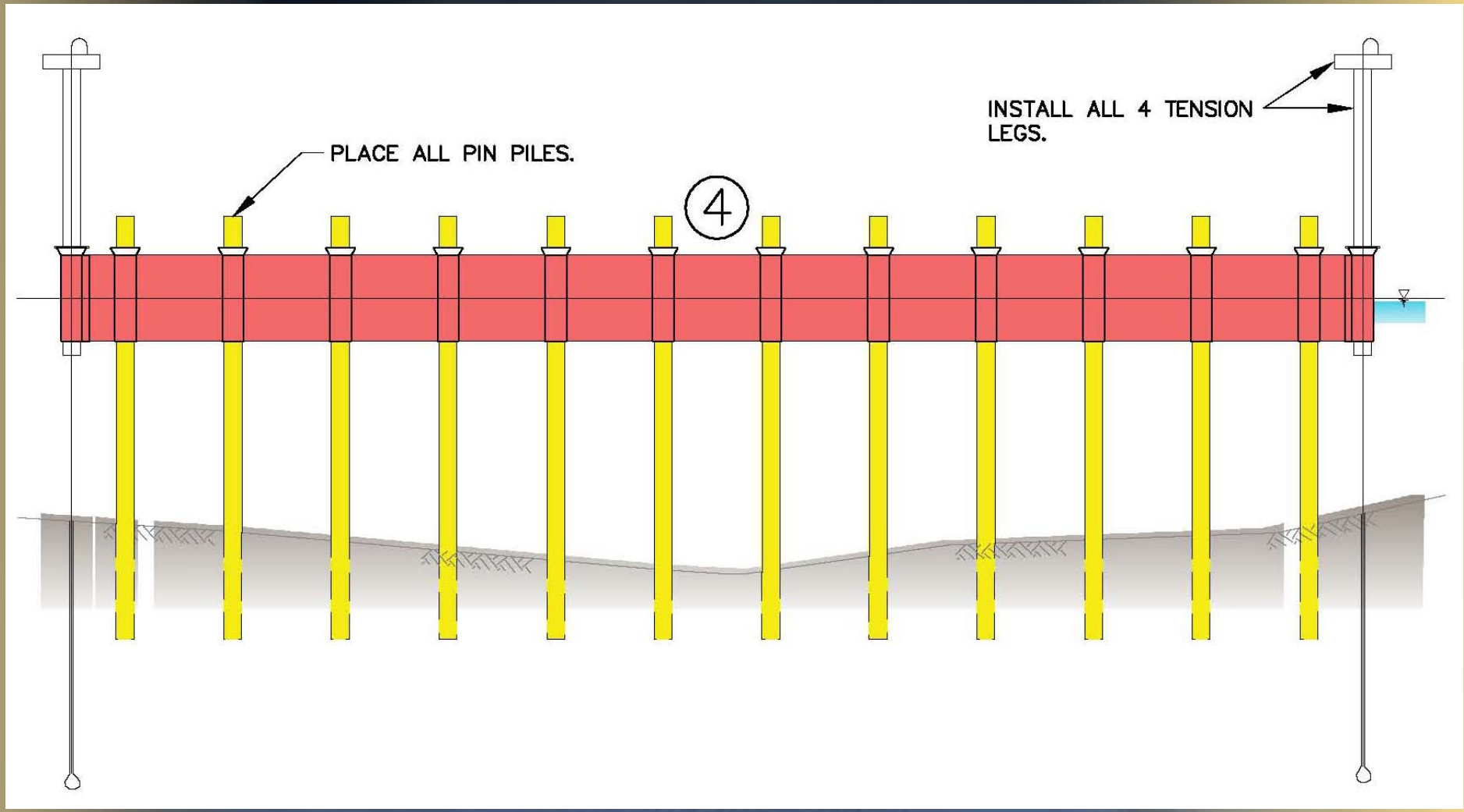

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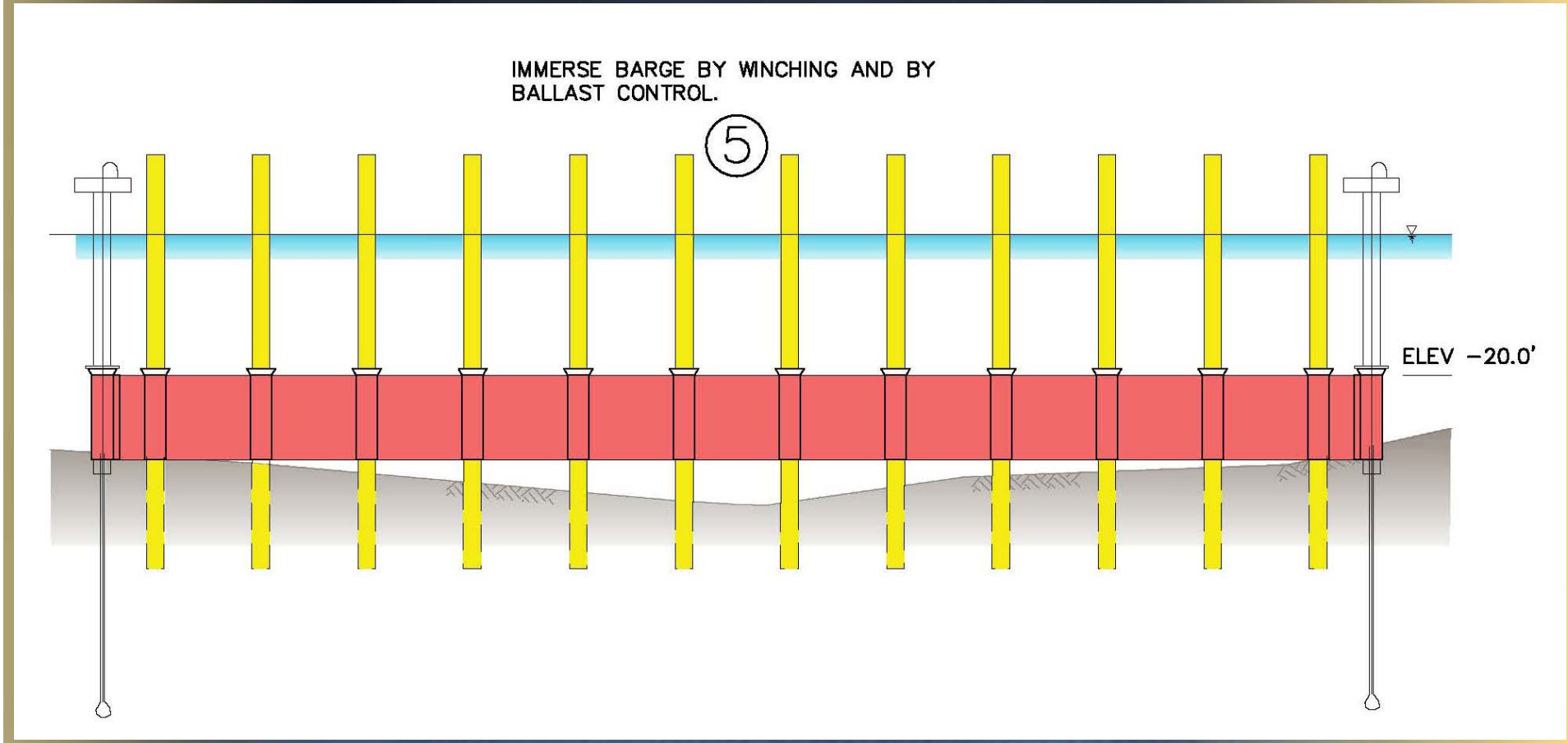

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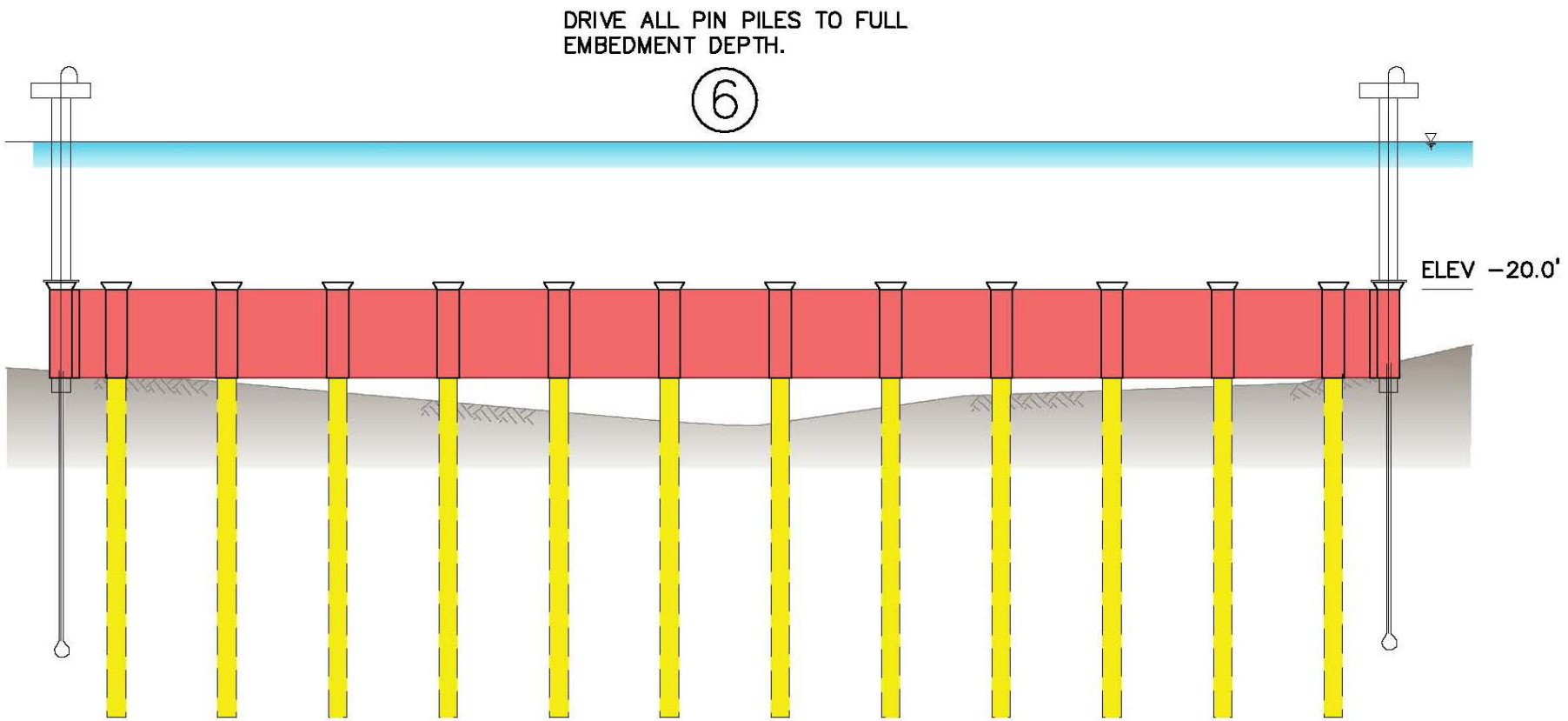

Draft Engineering Criteria

- Minimum Navigation Draft Clearance = 10’ @ 0’ MLLW
- Maximum Differential Head = 3’
- Minimum Navigation Width Clearance = 60’
- Flow Constriction:
  - Closed - 90% of Flow Area
  - Open – 60% of Flow Area
- Tidal Characteristics:
  - MLLW = 0’
  - MHHW = +3.4’
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- Gate / Barrier:
  - Sliding
  - Radial Segment
  - Butterfly
  - Flap
- Barrier Only:
  - Louvered System
  - Pendant
- Marginal Closure Area:
  - Sheetpile
  - Rock Fill

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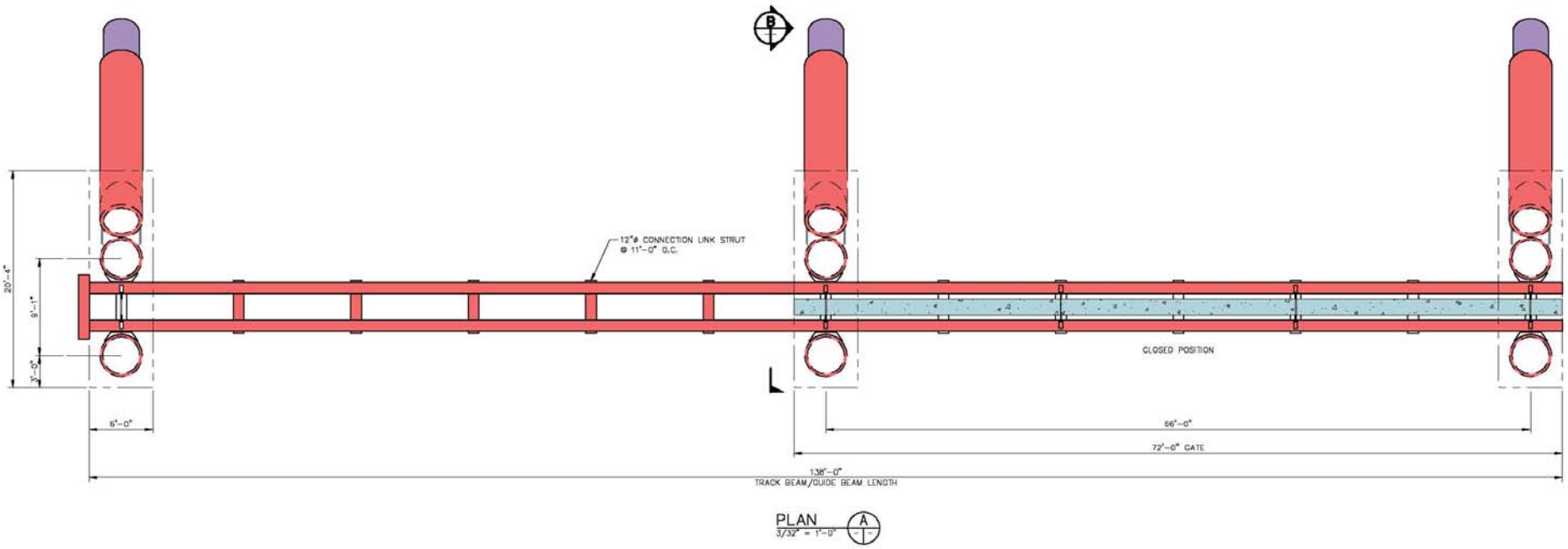
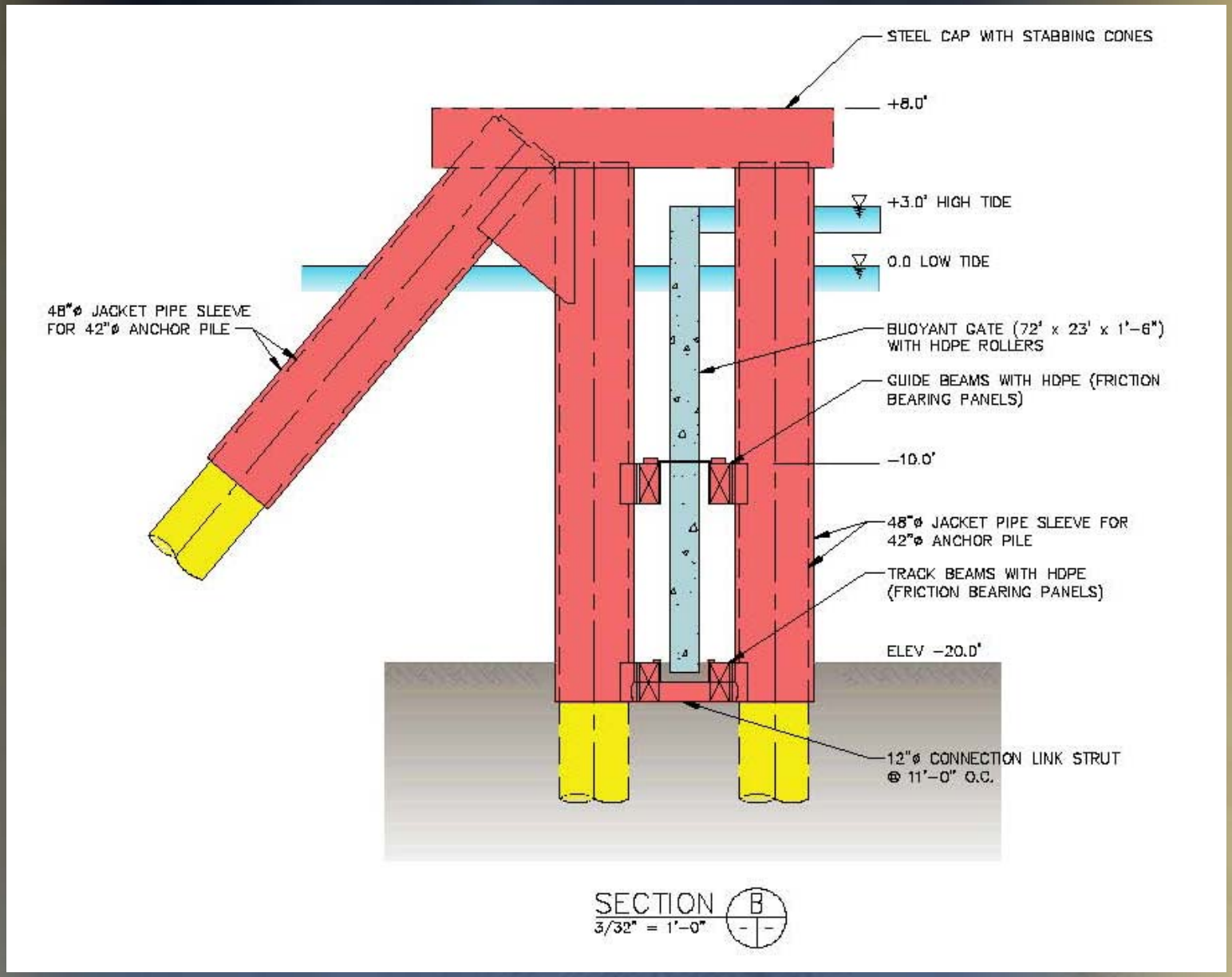
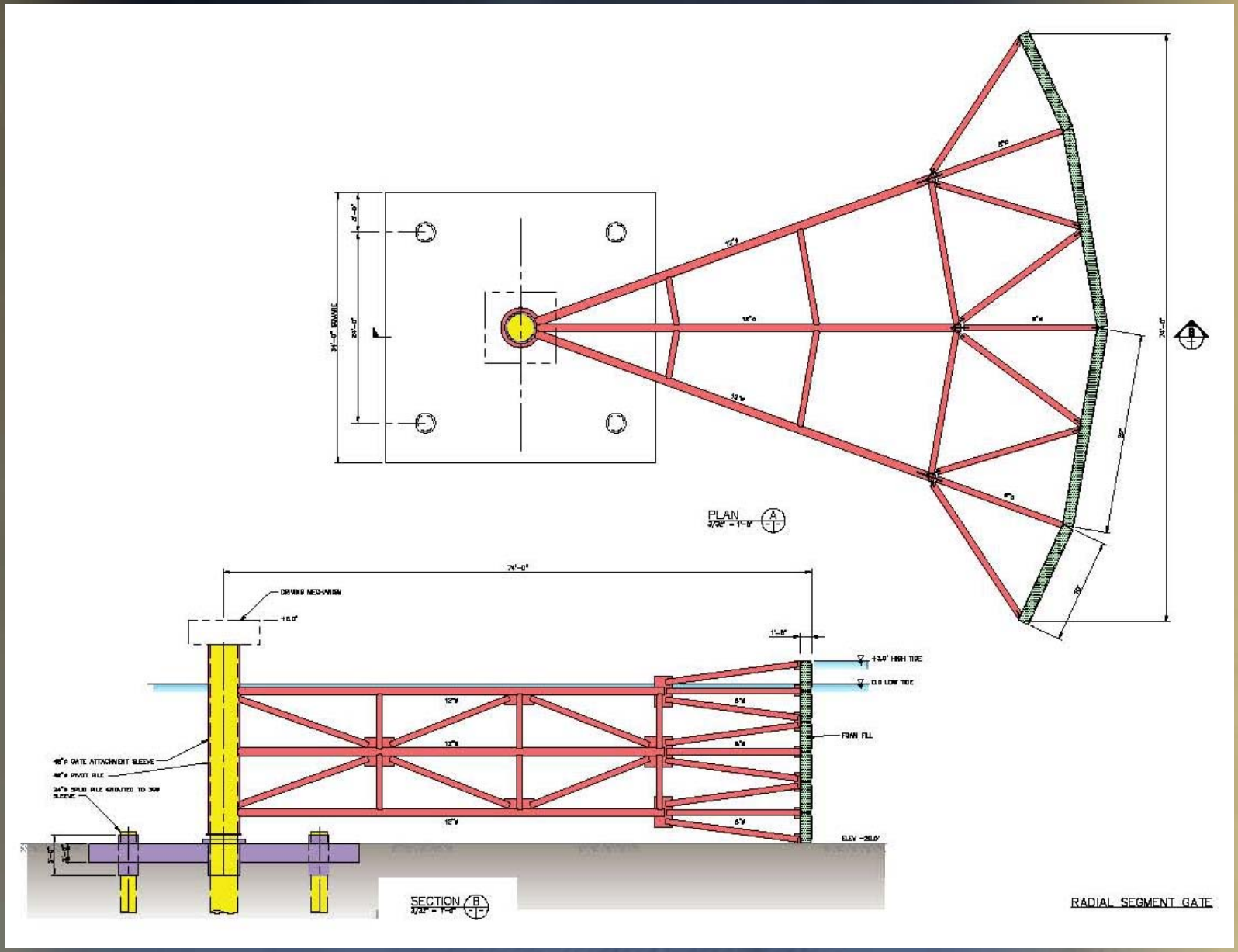
Gate / Barrier Concepts – Sliding



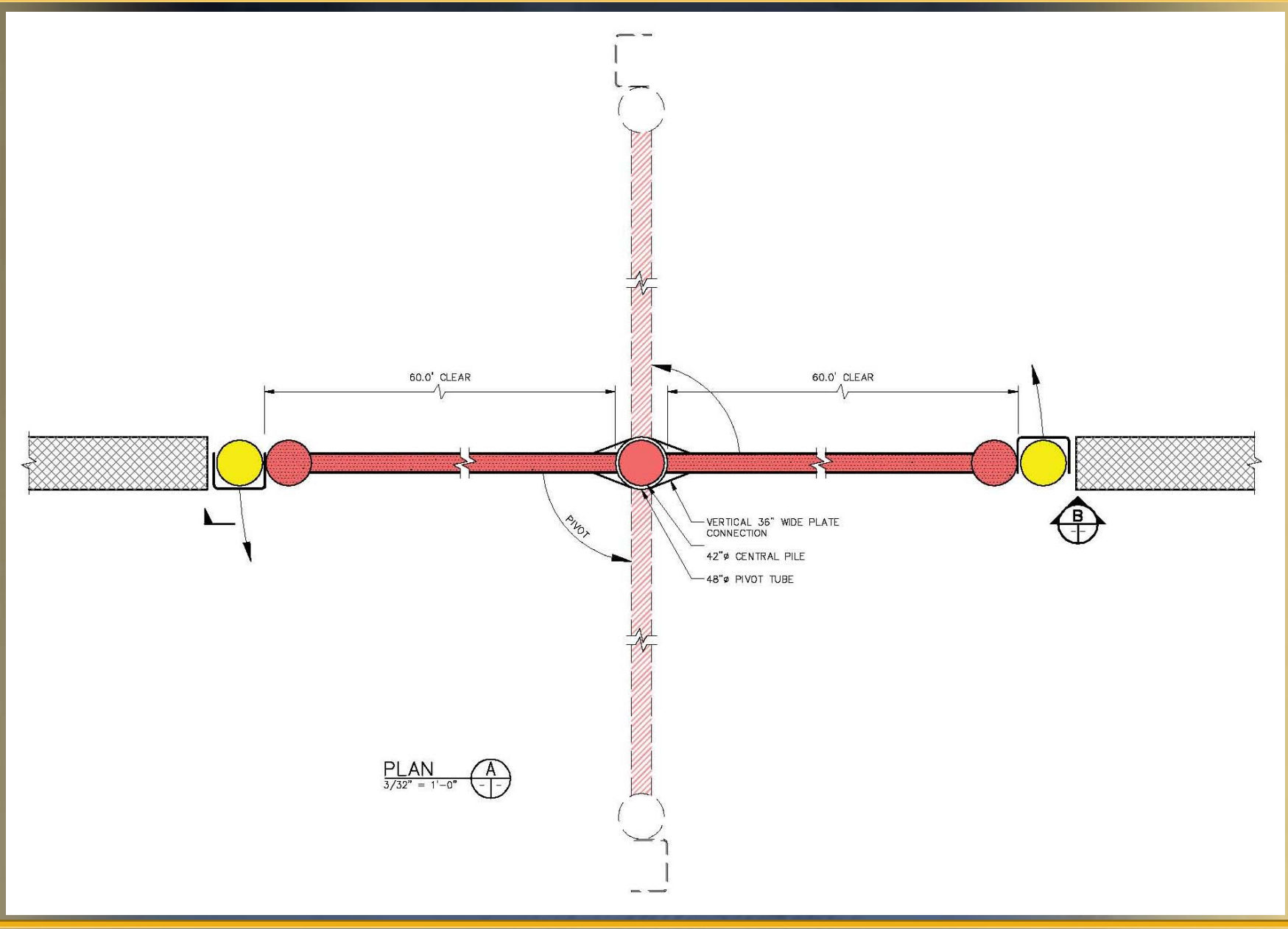
Gate / Barrier Concepts – Sliding



Gate / Barrier Concepts – Radial Segment



Gate / Barrier Concepts – Butterfly



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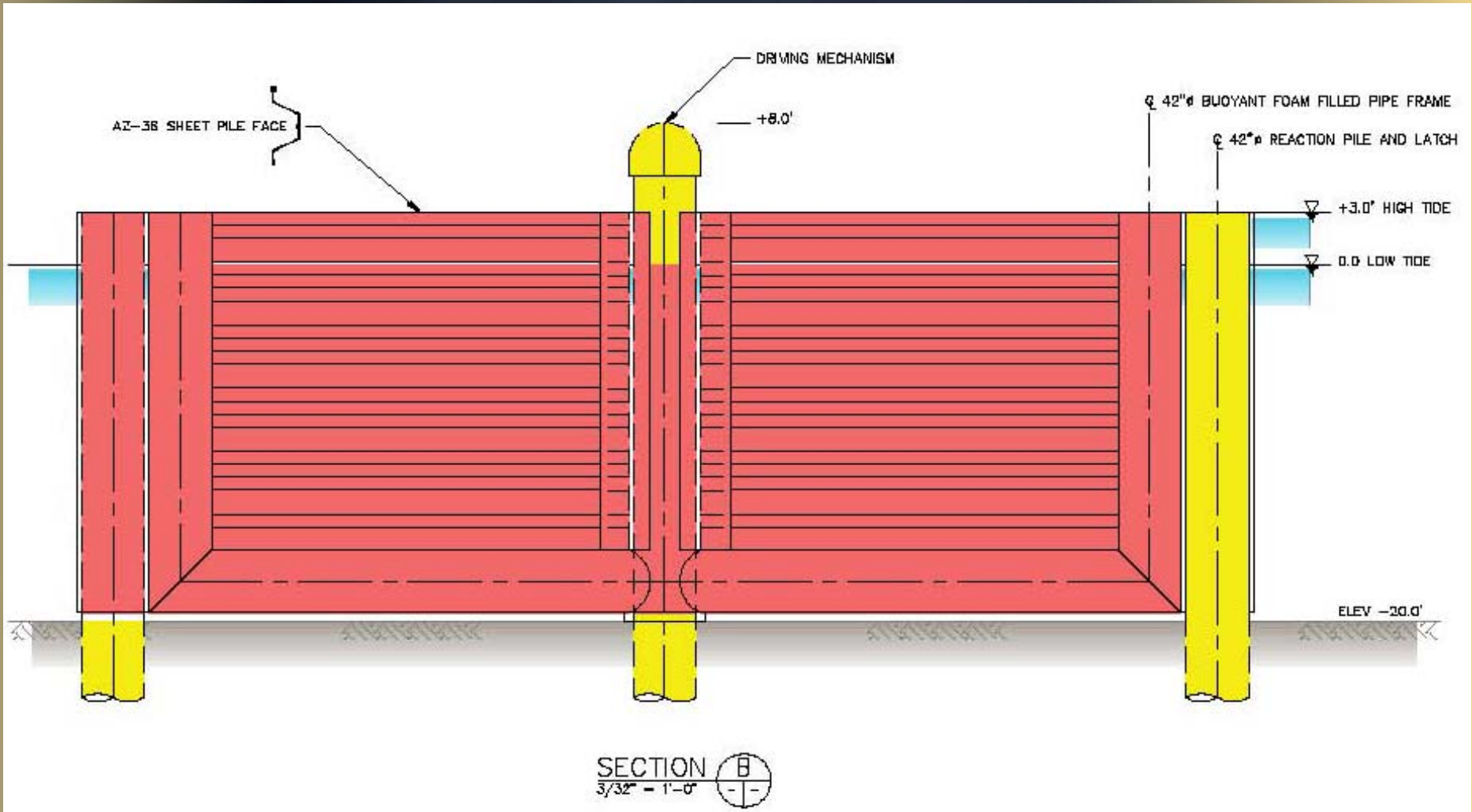
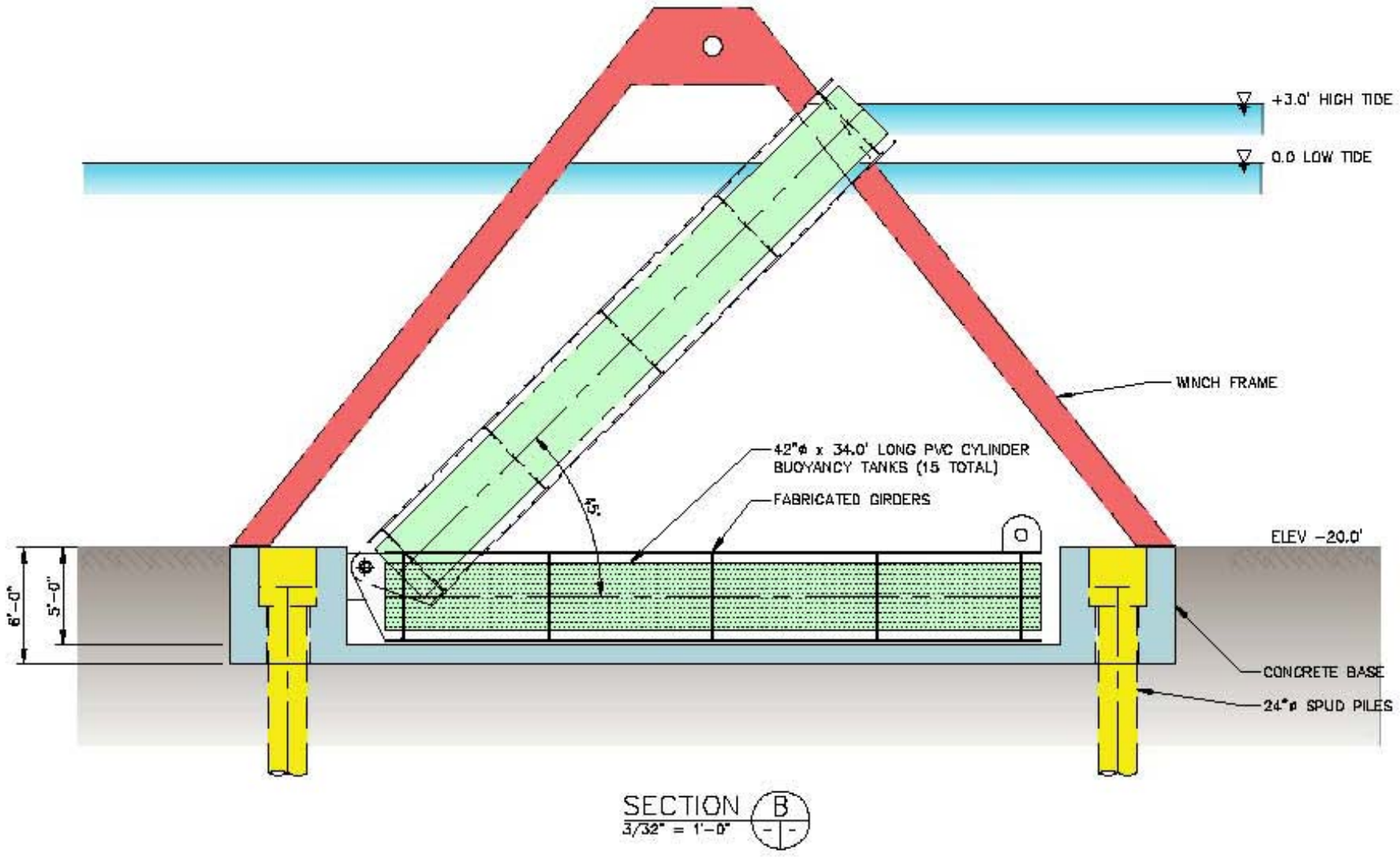


Gate / Barrier Concepts – Flap



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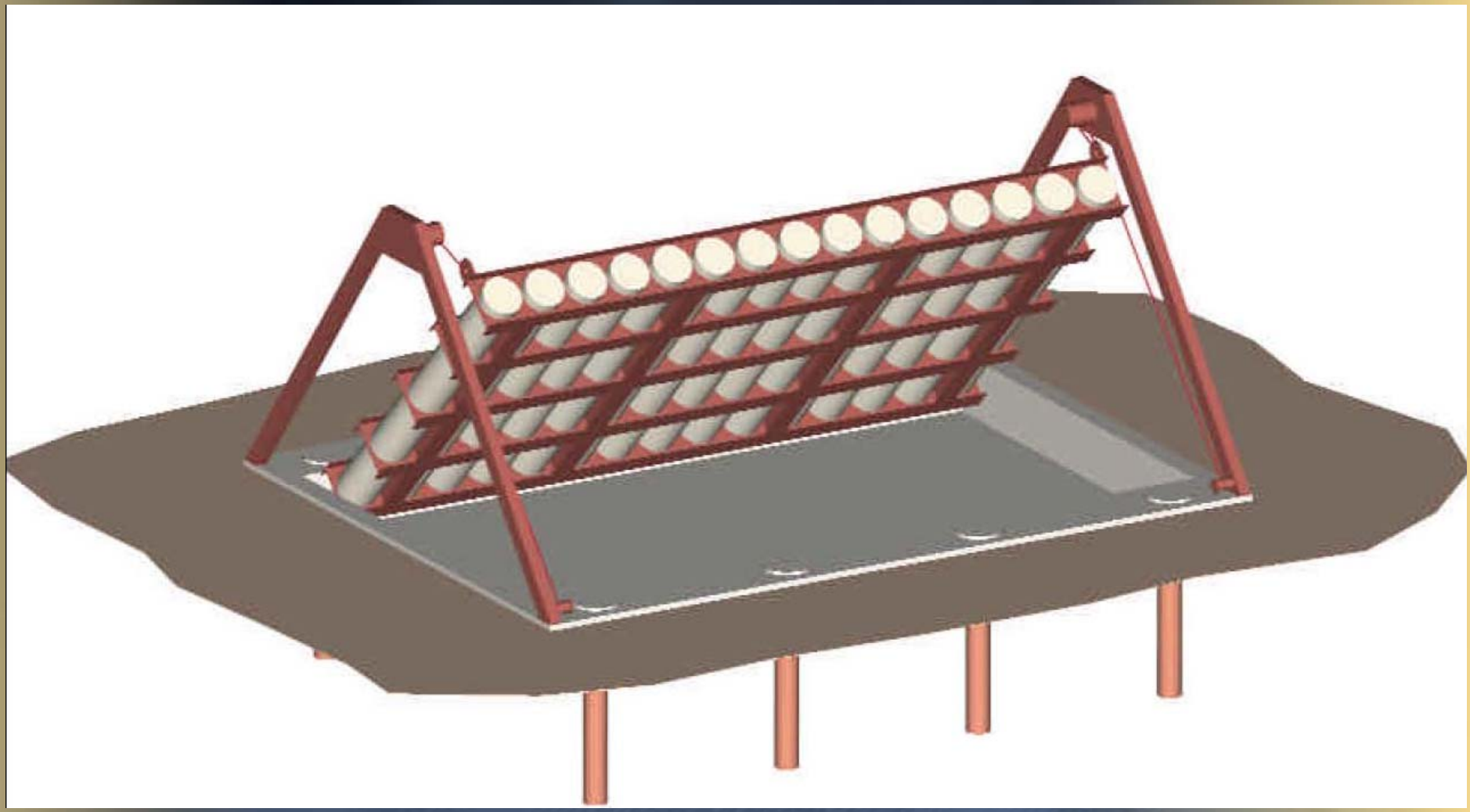

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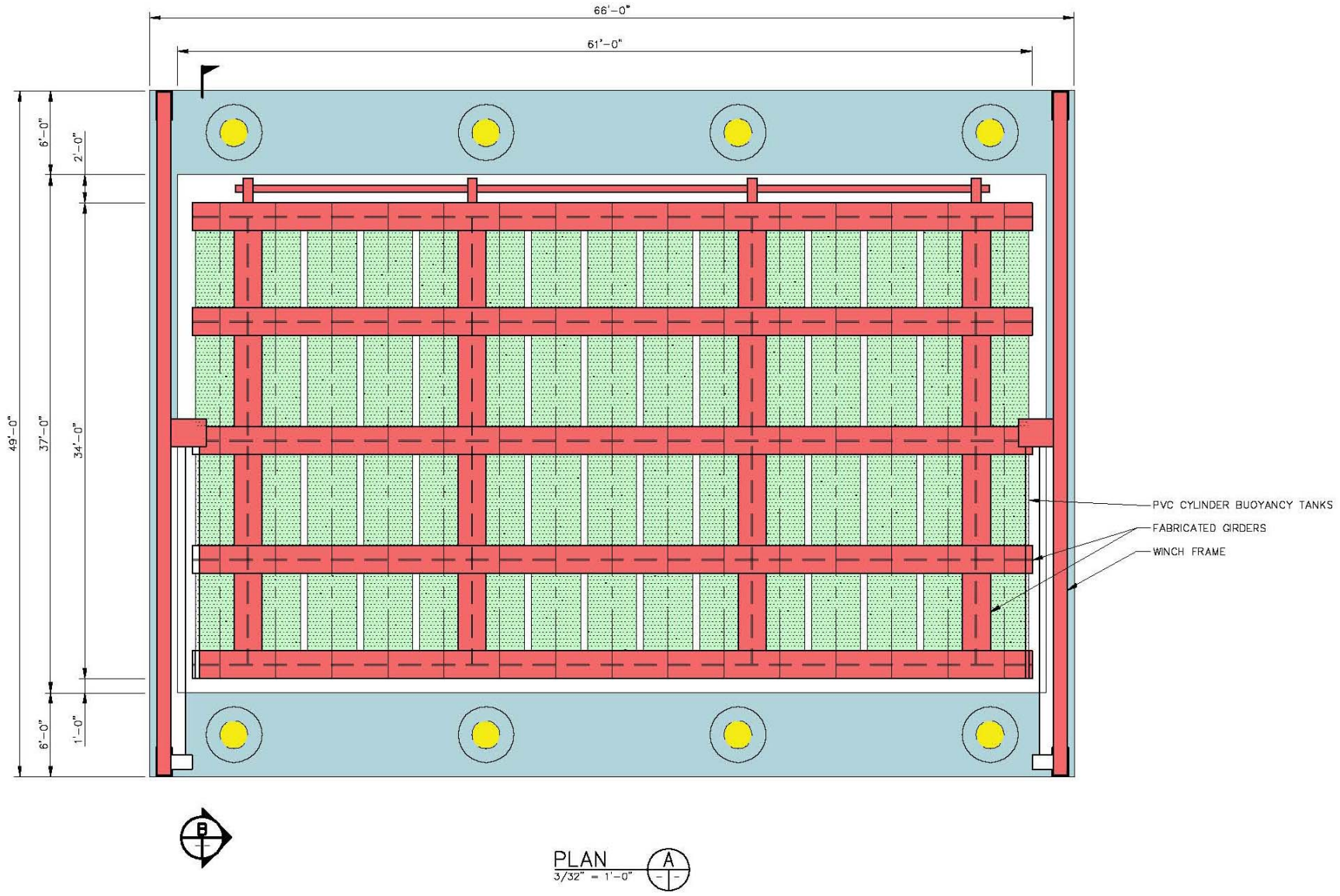

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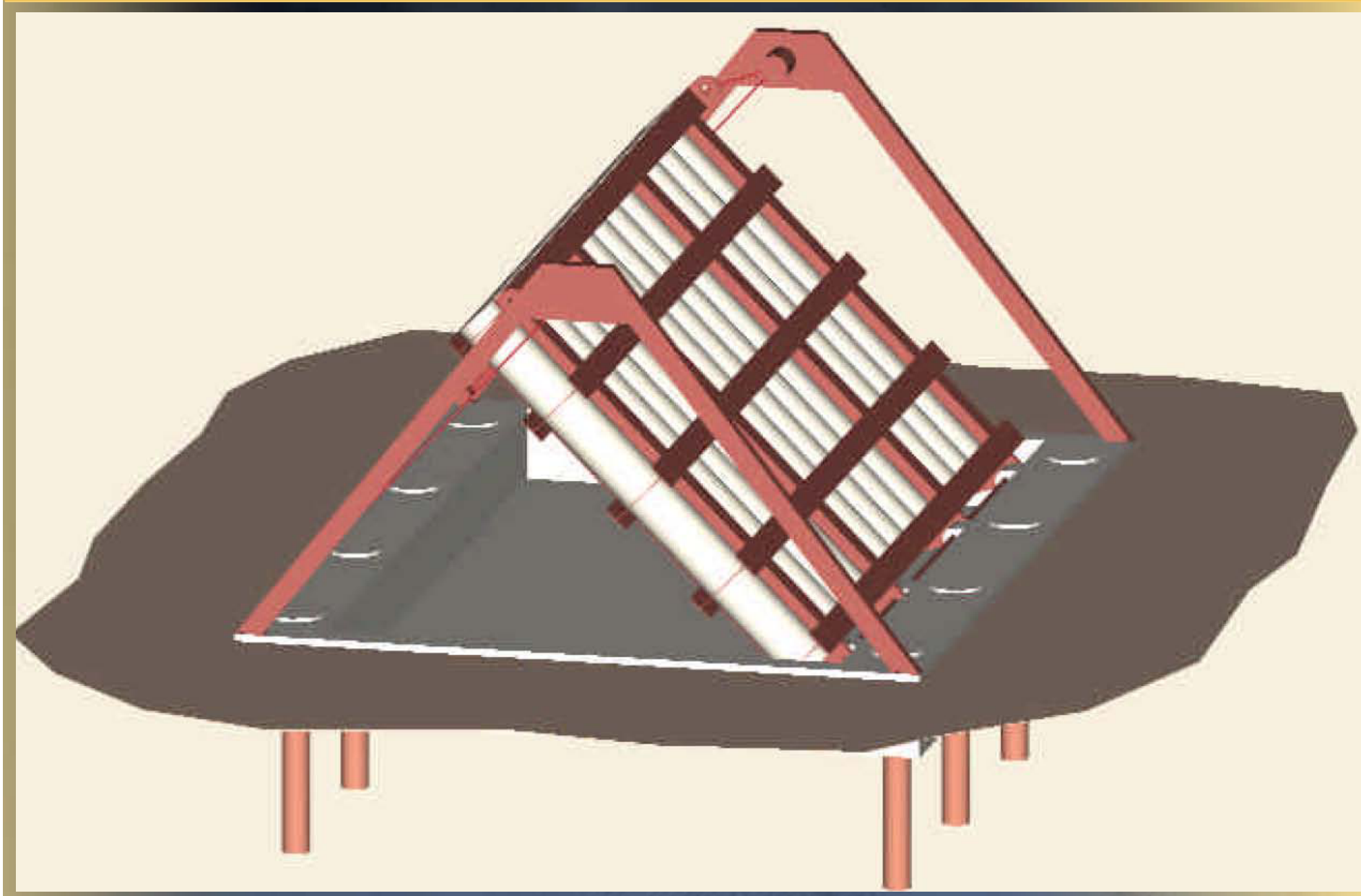

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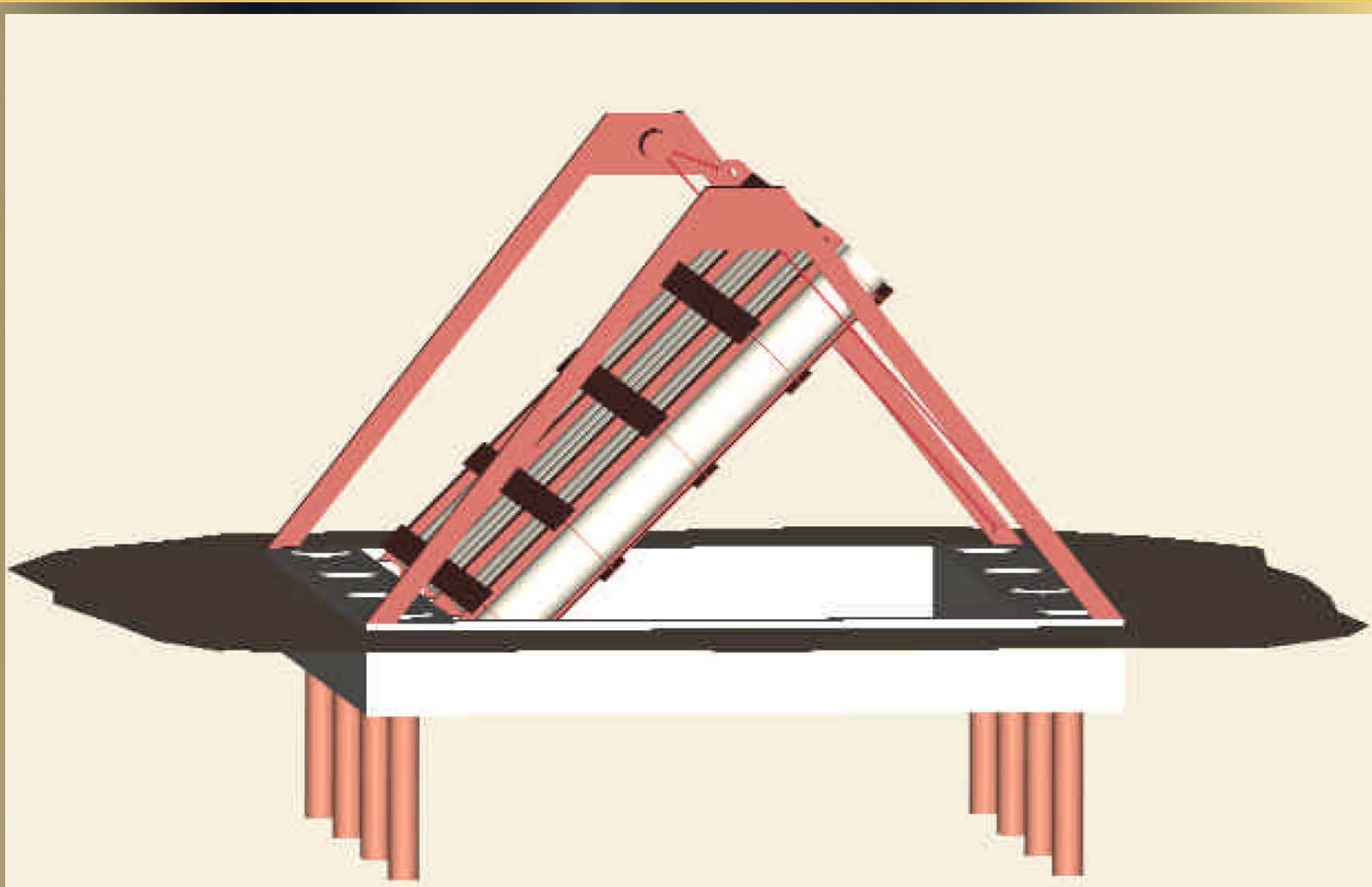
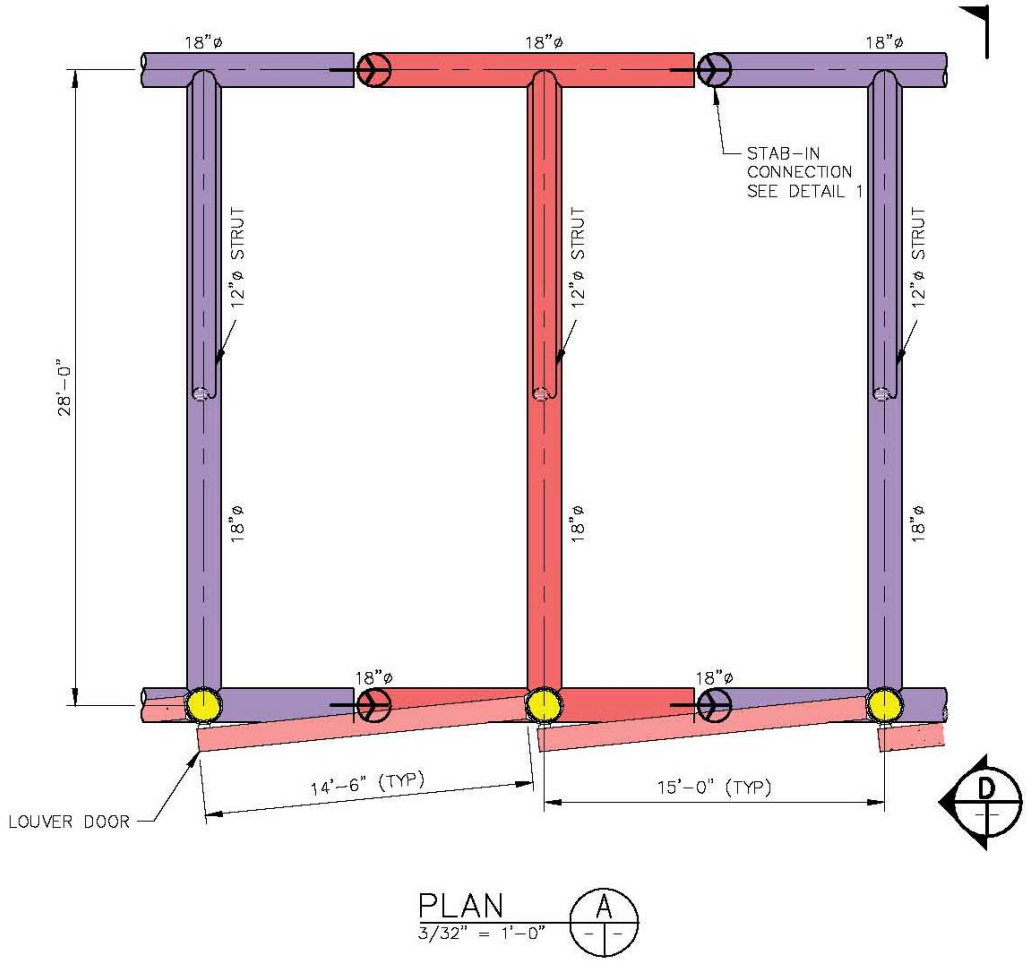
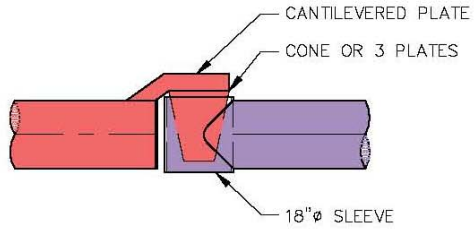


Barrier Only Concepts – Louvered System

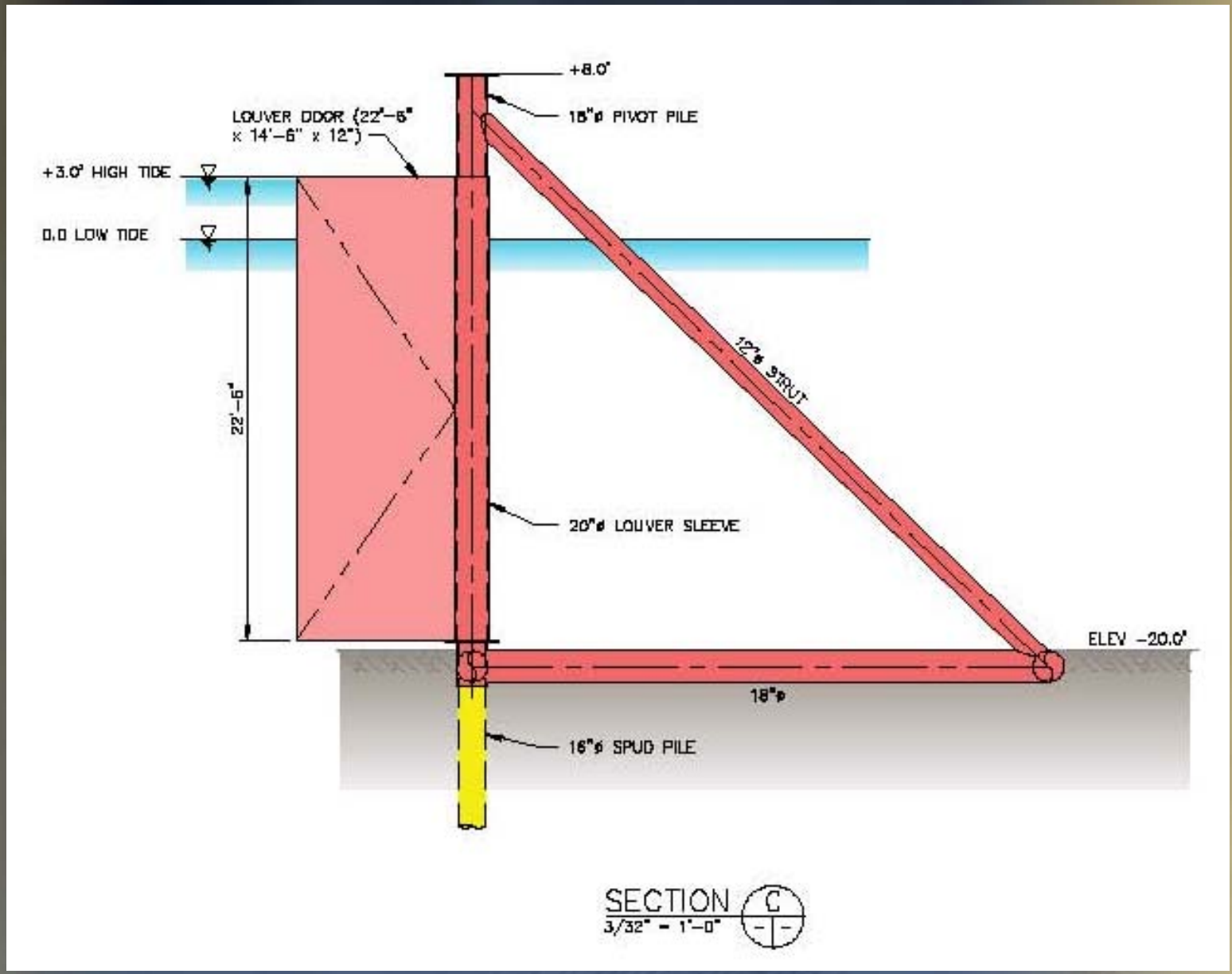


PLAN
3/32" = 1'-0"
A

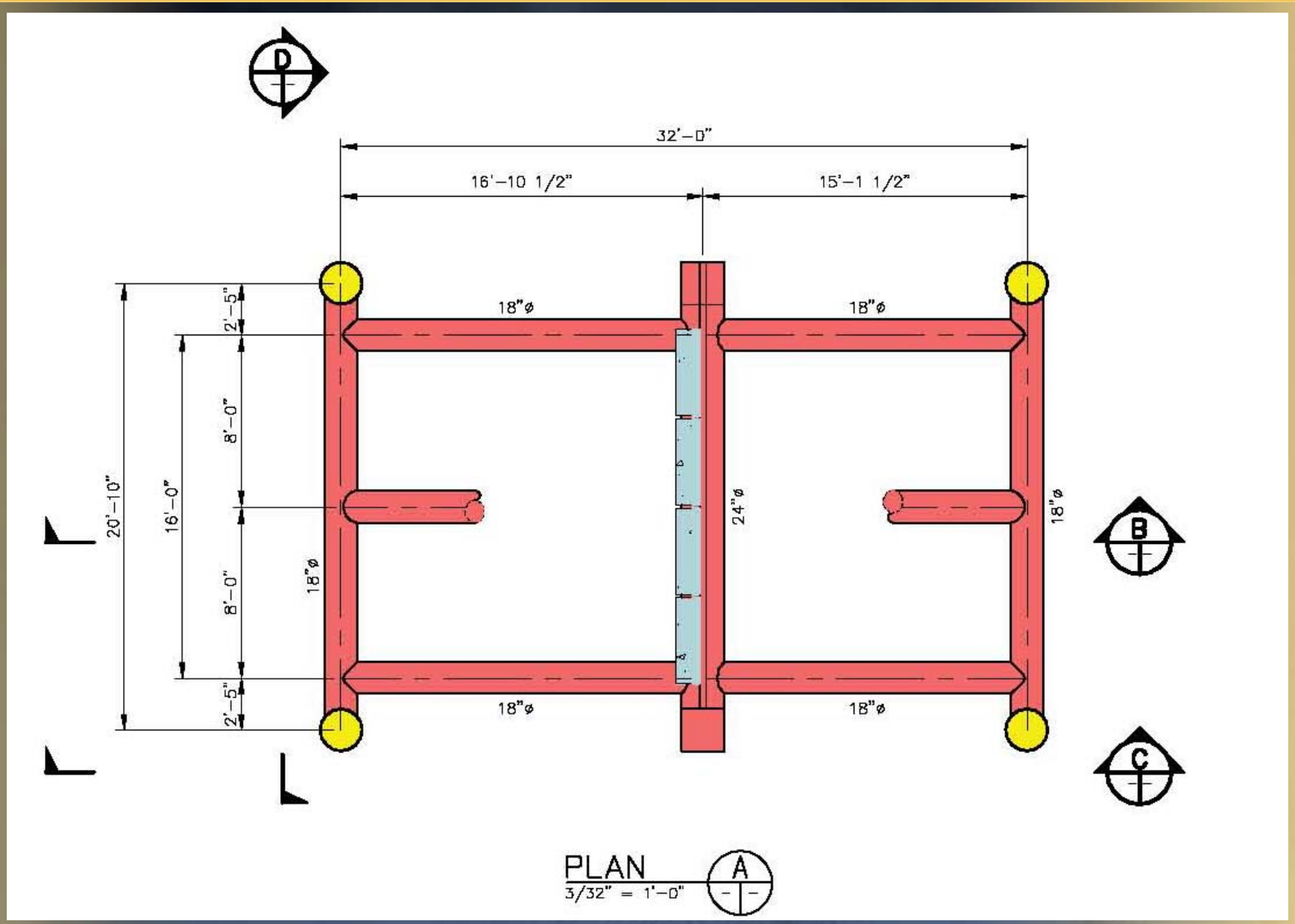


DETAIL
3/16" = 1'-0"
1

Barrier Only Concepts – Louvered System



Barrier Only Concepts – Pendant



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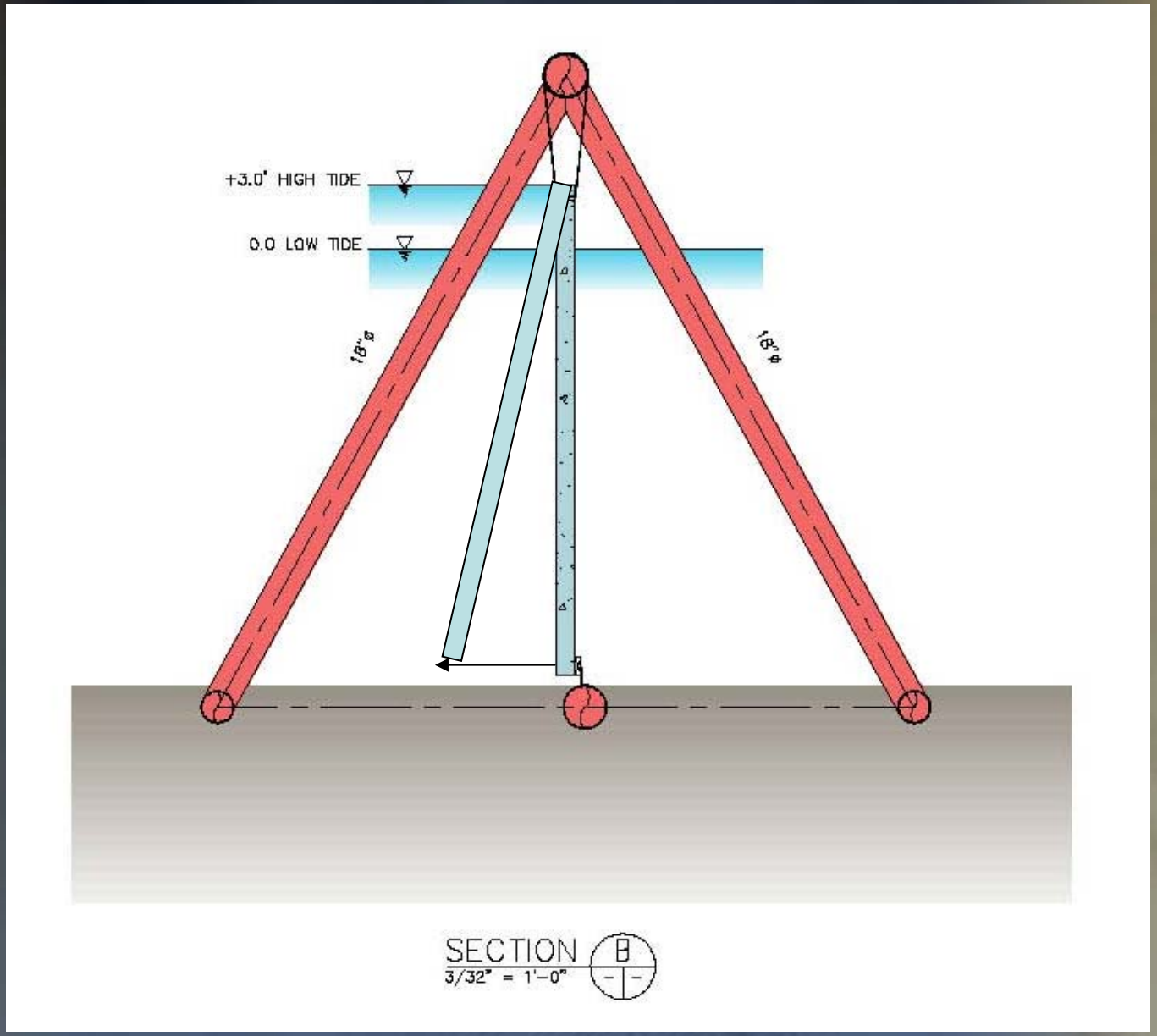

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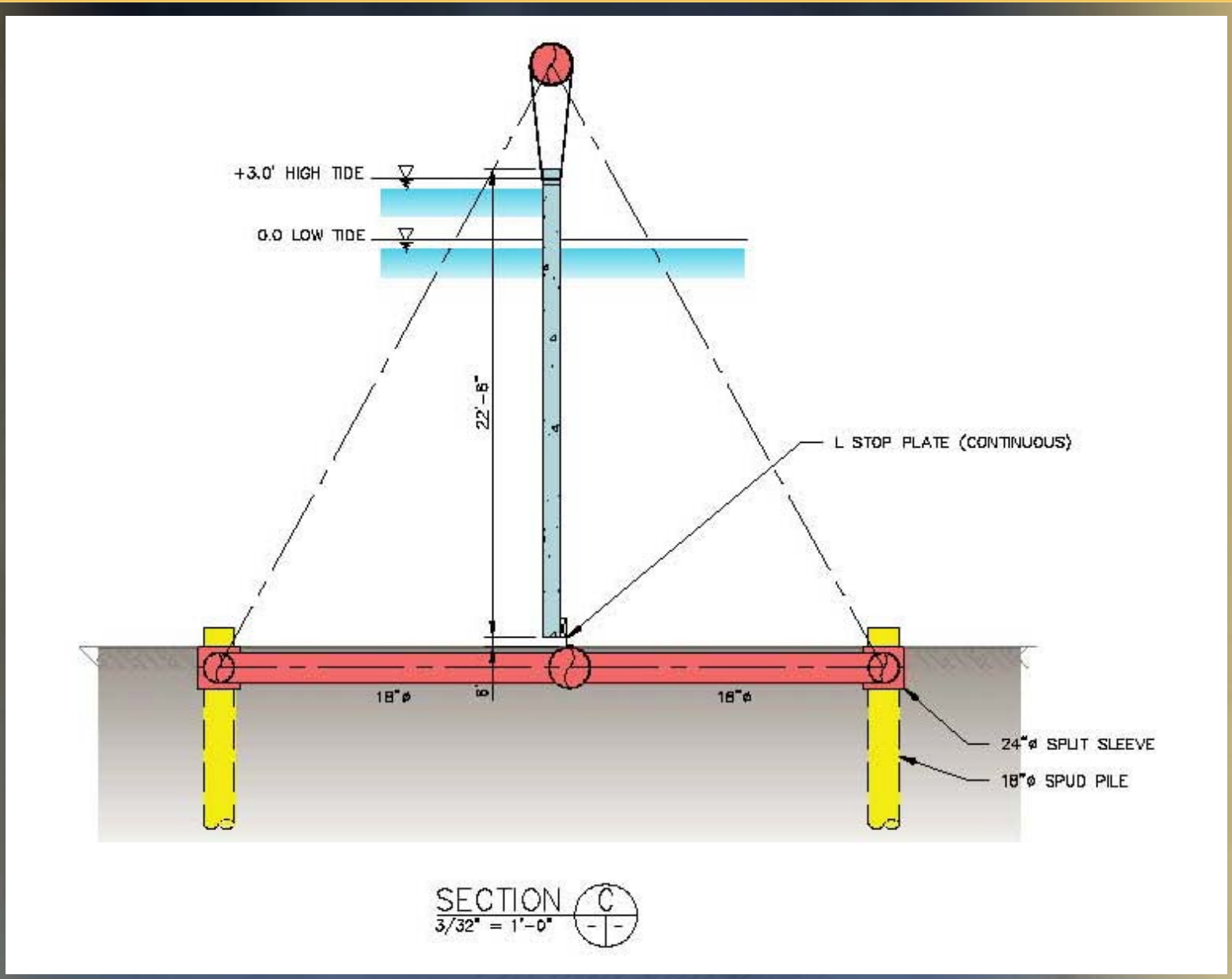

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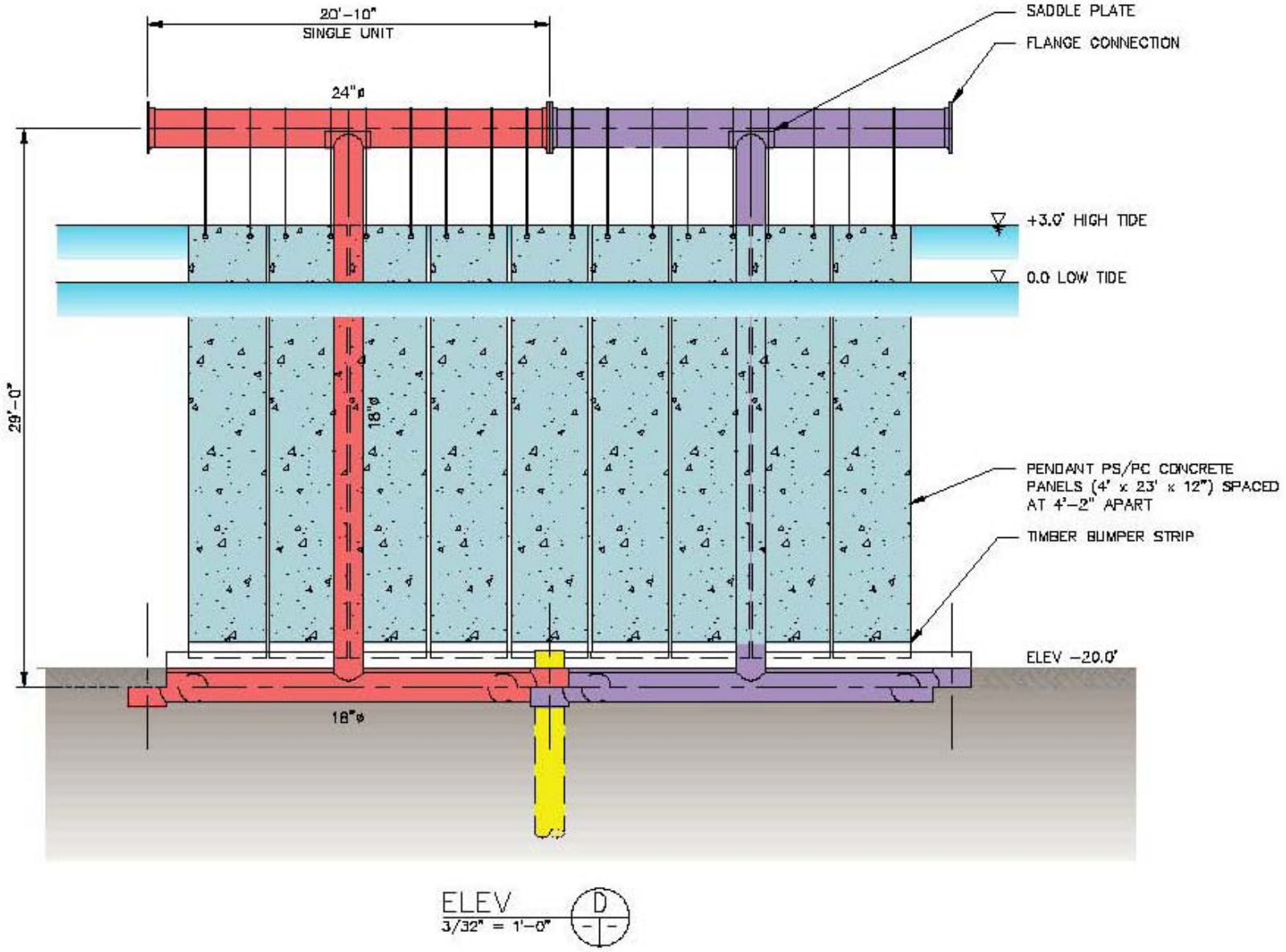

Marginal Closure Area

- Sheetpile
- Rock Fill
- Other ?

Path Forward

- Confirm Project Objectives
- Concurrence on Engineering Criteria
- Select Location / Section
- Identify Candidate Concept(s)
  - Gate
  - Barrier
  - Marginal Closure Area
- Indicative Cost (+/- 40%)
- Documentation

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